CLAIMS

What is claimed is:

1. A method of treating a subject suffering from a cardiovascular disease comprising the step of administering to the subject an effective amount of a composition to modulate cyclin dependent kinase 9 (Cdk9) activity, wherein the effective amount modulates hypertrophic growth.

2. The method of claim 1, wherein the cardiovascular disease is heart failure.

3. The method of claim 1, wherein the composition comprises a Cdk9 inhibitor.

4. The method of claim 3, wherein the Cdk9 inhibitor is flavopiridol.

5. The method of claim 1, wherein the composition comprises a compound that modulates Cdk9 activity by prohibiting the dissociation of 7SK snRNA from cyclin T/Cdk9 complex.

6. The method of claim 5, wherein the composition comprises an inhibitor of Gq.

7. The method of claim 6, wherein the Gq inhibitor is selected from the group consisting of angiotensin II inhibitors, ACE inhibitors and endothelin inhibitors.

8. The method of claim 5, wherein the composition comprises an inhibitor of calcineurin.

9. The method of claim 8, wherein the calcineurin inhibitor is selected from the group consisting of angiotensin II inhibitors, ACE inhibitors and endothelin inhibitors.

10. The method of claim 1, wherein the composition comprises a compound that upregulates the levels of 7SK snRNA.

11. A method of modulating myocyte enlargement in a subject at risk for cardiac hypertrophy comprising the steps of administering to the subject an effective amount of a composition to modulate cyclin dependent kinase 9 (Cdk9) activity, wherein the effective amount modulates myocyte enlargement.

12. The method of claim 11, wherein the composition comprises a Cdk9 inhibitor.

13. The method of claim 12, wherein the Cdk9 inhibitor is flavopiridol.

14. The method of claim 11 wherein the composition comprises a compound that modulates Cdk9 activity by prohibiting the dissociation of 7SK snRNA from cyclin T1/Cdk9 complex.

15. A method of modulating cardiac hypertrophy comprising the step of administering to a subject an effective amount of a composition to modulate cyclin dependent kinase 9 (Cdk9) activity, wherein the effective amount modulates hypertrophic growth.

16. The method of claim 15, wherein the composition comprises a Cdk9 inhibitor.

17. The method of claim 16, wherein the Cdk9 inhibitor is flavopiridol.

18. The method of claim 15, wherein the composition comprises a compound that modulates Cdk9 activity by prohibiting the dissociation of 7SK snRNA from cyclin T/Cdk9 complex.

19. The method of claim 18, wherein the composition comprises an inhibitor of Gq.

20. The method of claim 19, wherein the Gq inhibitor is selected from the group consisting of angiotensin II inhibitors, ACE inhibitors and endothelin inhibitors.

21. The method of claim 18, wherein the composition comprises an inhibitor of calcineurin.

22. The method of claim 21, wherein the Gq inhibitor is selected from the group consisting of angiotensin II inhibitors, ACE inhibitors and endothelin inhibitors.

23. The method of claim 15, wherein the composition comprises a compound that upregulates the levels of 7SK snRNA.

24. A method of treating heart failure comprising the step of administering to a subject an effective amount of a composition to modulate cyclin dependent kinase 9 (Cdk9) activity.

25. The method of claim 24 further comprising administering calcium channel blocking agents, β-adrenergic blocking agents, angiotensin II inhibitors or ACE inhibitors.

26. A method of modulating a decrease in cardiac muscle contractile strength in a subject comprising the step of administering to the subject an effective amount of a composition to

modulate cyclin dependent kinase 9 (Cdk9) activity, wherein the effective amount modulates the decrease in cardiac muscle contractile strength.

27. A method of treating a subject at risk for ventricular dysfunction associated with cardiac hypertrophy comprising the steps of administering to the subject an effective amount of a composition to modulate cyclin dependent kinase 9 (Cdk9) activity, wherein the effective amount decreases ventricular dysfunction.

28. A method of screening for a modulator of cyclin-dependent kinase 9 (Cdk9) comprising:

obtaining Cdk9;

contacting the Cdk9 with a candidate substance; and

assaying for Cdk9 activity, wherein when the Cdk9 activity changes after the contacting, the candidate substance is a modulator of Cdk9.

29. The method of claim 28, wherein the candidate substance inhibits Cdk9.

30. The method of claim 28, wherein the candidate substance prohibits the dissociation of 7SK snRNA from cyclin T/Cdk9 complex.

31. The method of claim 28, wherein assaying comprises RNA hybridization.

32. The method of claim 28, wherein assaying comprises PCR.

33. The method of claim 28, wherein assaying comprises RT-PCR.

34. The method of claim 28, wherein assaying comprises immunodetection.

35. The method of claim 34, wherein immunodetection comprises Western blot, ELISA or indirect immunofluorescence.

36. A method of modulating cardiomyocyte apoptosis in a subject at risk or having a cardiovascular disease comprising the step of administering to the subject a therapeutically effective amount of a composition that modulates mitochondrial function.

37. The method of claim 36, wherein the cardiovascular disease is heart failure.

38. The method of claim 36, wherein the composition comprises a Cdk9 inhibitor.

39. The method of claim 36, wherein the composition comprises a modulator of PGC-1.

40. A method of treating heart failure in a subject comprising administering a therapeutically effective amount of an anti-apoptotic composition to the subject.

41. The method of claim 40, wherein the composition comprises a Cdk9 inhibitor.

42. The method of claim 40, wherein the composition comprises a modulator of PGC-1.